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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,549	01/30/2006	Kazuhiko Fukutani	03500.102994.	7631

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EXAMINER

SINES, BRIAN J

ART UNIT	PAPER NUMBER
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1743

MAIL DATE	DELIVERY MODE
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07/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,549	Applicant(s) FUKUTANI ET AL.	
	Examiner Brian J. Sines	Art Unit 1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-9 is/are rejected.
- 7) ☒ Claim(s) 6 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/24/2007 has been entered.

Response to Arguments

Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

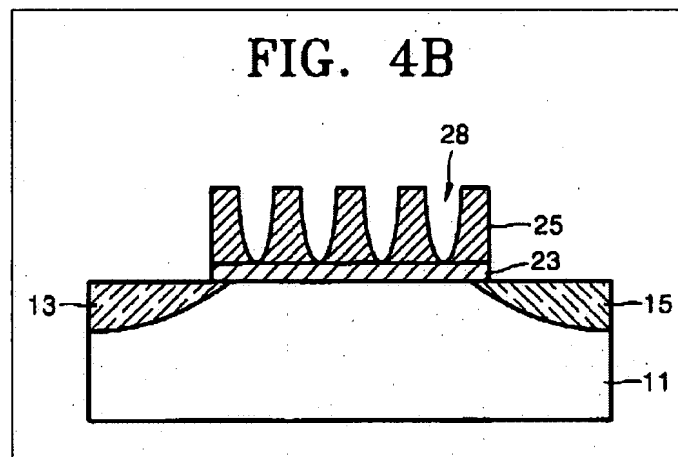
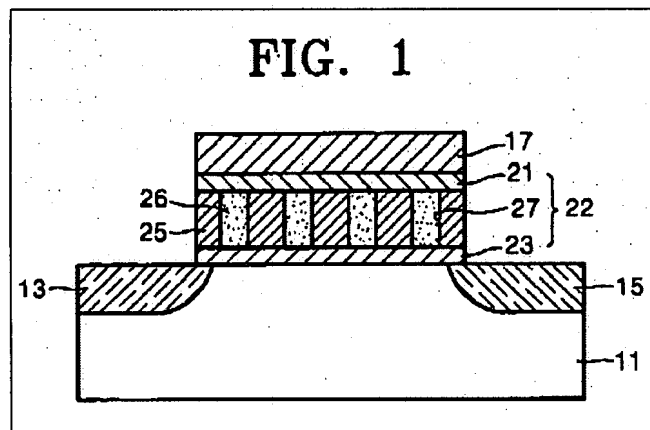
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 3 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Choi et al. (U.S. Pat. No. 6,949,793 B2) (hereinafter "Choi").

Regarding claim 1, Choi teaches a field effect transistor device structure comprising: a substrate 11 comprising a source region 13 and a drain region 15; an insulating layer 23 arranged on the substrate; and a porous body 25 which has pillar-shaped holes comprising quantum dots 27 arranged on the insulating layer, wherein the insulating layer 23 is positioned between the substrate 11 and the porous body 25 (see col. 3, line 51 – col. 4, line 29; figures 1 and 4B).



Choi indicates the plurality of holes 28 or pores in layer 25 have a size or diameter of less than 10 nm (see col. 5, lines 53 – 65; figure 4B). Therefore, Choi anticipates that the average pore diameter of the pillar-shaped pores is 50 nm or less.

Regarding claim 3, Choi teaches that the porous layer 25 is comprised of an insulating material comprising aluminum oxide (see col. 4, lines 16 – 29).

Regarding claim 7, Choi teaches the incorporation of a material 26 comprising silicon, silicon nitride and metal disposed on the surface of the pillar-shaped holes as a quantum dot 27 for essentially functioning to detect and store electronic charge (see, e.g., col. 4, lines 5 – 60).

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Apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. The manner of operating an apparatus does not differentiate an apparatus claim from the prior art, if the prior art apparatus teaches all of the structural limitations of the claim (see MPEP § 2114).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi in view of Fukutani et al. (U.S. Pat. No. 7,074,480 B2) (hereinafter "Fukutani").

Regarding claim 4, Fukutani teaches a porous body comprising a plurality of pillar-shaped pores suitable for use and incorporation in various types of devices where this type of porous body structure is desired (see, e.g., Abstract; col. 43, lines 1 – 11) (see MPEP § 2144.07). Fukutani teaches that the porous body comprises silicon, germanium or a combination of these materials (see, e.g., col. 1, lines 40 – 59). Fukutani also teaches an oxide porous body comprising

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silicon oxide (see, e.g., col. 11, lines 55 – 62). The selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art (see MPEP § 2144.07). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of these materials within the porous body structure as claimed with the disclosed device.

2. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi in view of Webb et al. (U.S. Pat. No. 5,004,700) (hereinafter “Webb”) and Hijikihigawa et al. (U.S. Pat. No. 5,140,393 A) (hereinafter “Hij.”).

Regarding claims 7 and 8, as discussed above, Choi teaches the field effect transistor structure as claimed. However, Choi does not specifically teach the use of the disclosed field effect transistor as a sensing device as intended. Webb teaches a sensing device comprising a similar field effect transistor (see, e.g., Abstract). Consequently, as shown by Webb, a person of ordinary skill in the art would accordingly have recognized the suitability of using the disclosed field effect transistor device as a component of a sensing device (see MPEP § 2144.07). Furthermore, as shown by Webb, a person of ordinary skill in the art would have had a reasonable expectation for success of incorporating the use of a field effect transistor device as a component of a sensing device (see MPEP § 2143.02). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of the disclosed field effect transistor as a component of a sensing device as claimed.

As shown by Hij., the use of field effect transistor (FET) devices in biosensing applications is well known in the art (see, e.g., Hij.; col. 6, line 25 – col. 7, line 33) (see MPEP § 2144.03). Hij. teaches the use of a biomaterial, glucose oxidase, as a detection material (see col.

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7, lines 10 – 33). Thus, a person of ordinary skill in the art would accordingly have had a reasonable expectation for success in incorporating the use of a biomaterial as a detecting material in field effect transistor-based sensing device (see MPEP § 2143.02). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the use of a biomaterial as a detection material in an field effect transistor-based sensing device as claimed.

Allowable Subject Matter

Claims 6 and 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the cited prior art, in particular Choi and Fukutani, do not appear to fairly teach or suggest the specified mean pore density for the porous body.

Conclusion

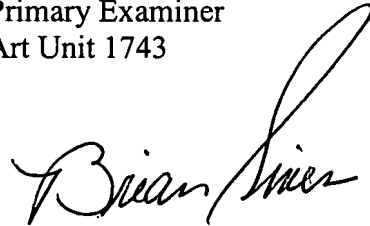
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines whose telephone number is (571) 272-1263. The examiner can normally be reached on Monday - Friday (11 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Brian J. Sines
Primary Examiner
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A handwritten signature in black ink, appearing to read "Brian Sines", with a large, stylized loop at the end of the last name.